TEACHERS' RETIREMENT BOARD

INVESTMENT COMMITTEE

SUBJECT: General- Investment Management Plan ITEM NUMBER: 8

ATTACHMENT(S): 1

ACTION: _____ DATE OF MEETING: August 5, 1998

INFORMATION: X PRESENTER(S): Mr. Mitchell

EXECUTIVE SUMMARY

One of the 1997/98 Investment Branch objectives was to "Prepare and present the Investment Management Plan incorporating the asset allocation targets and ranges approved by the Investment Committee". The first draft was presented to the Investment Committee last month. In the July Investment Committee meeting it was suggested that the Investment Management Plan should be considered a statement of "Investment Philosophy" for the California State Teachers' Retirement System.

Attachment 1 is the Investment Management Plan which has been revised to reflect the comments and suggestions provided at the July Investment Committee meeting. The major change was the inclusion of a discussion on asset allocation (pages 6-10).

Additional discussion and suggestions are encouraged. The intent is to have a final draft to present at the September Investment Committee meeting.

INVESTMENT MANAGEMENT PLAN

EXECUTIVE SUMMARY

The Investment Management Plan was developed within the context of the significant events which have occurred during the eighty five year history of California State Teachers' Retirement System ("System", "STRS"). The System was primarily on a pay as-you-go basis until 1972. Since that time, increased contributions coupled with rapid economic growth have been compounded in more than $90 billion of investment assets. This document represents the most recent update of STRS's Investment Management Plan. STRS's Investment Management Plan is updated to reflect the changes which have occurred in the investment strategy and policy as a result of implementation of various recommendations. In addition, the Investment Management Plan is updated to ensure that the factors that impacted initial decisions are still relevant in the current environment.

The Teachers' Retirement Board ("Board") believes that to manage growth of assets in a prudent manner, it is necessary to establish a planning statement in the form of Investment Policies under which the portfolio will operate. The Board has sole and exclusive fiduciary responsibility to administer the investment assets in a manner that will assure the prompt delivery of benefits and related services to the plan participants and their beneficiaries. As a public pension fund, STRS is not subject to ERISA which governs corporate pension plans. However, the System's investment decision making continues to be based on the "prudent expert" standard for which the ERISA prudence standards serve as a basis. Additionally, the California Constitution requires diversification of risk across asset classes and minimizing of employer costs.

This document addresses general objectives governing the policies of the investment function and specific performance objectives. The general objectives are meant to provide a framework for the operation of the investment function. The System's performance objectives can be divided into: objectives for the overall investment function and objectives for investment managers.

The investment staff and the System's consultants work together to create a variety of optimal asset allocation alternatives. Constraints placed on each asset category prevent unrealistic asset allocation scenarios from consideration. Seven asset allocation alternatives were presented with unique risk/return characteristics.

The asset allocation decision governs the allocation of the System's assets between public, private, fixed income and equity. Strategic allocation of the System's assets is the most important factor in the determination of the realized total rate of return from the investment portfolio.

Strategic targets are established in a variety of asset categories to achieve the identified performance objectives. In conjunction with the strategic target, a range provides flexibility to adapt to changing market conditions.

Subsequent to the establishment of strategic targets an investment structure will be designed to guide and direct future investment decisions. In the preparation of the investment structure a variety of issues are addressed including:

1. Active vs passive management styles including the relative percentage of each style.

2. The number and types of internal and external managers.

3. Monitoring and controlling the direct and indirect costs of each asset class.

4. Appropriate reporting standards and time horizons.

GENERAL INVESTMENT OBJECTIVES

One goal for The California State Teachers' Retirement System is to "maintain a financially sound Retirement System". Within this context, the following general investment objectives are designed to establish a framework for the operation of the investment function and are nonspecific intentionally.

1. The STRS's investment program must provide the means to pay benefits to its participants and their beneficiaries in the amounts and at the times called for through the investment of contributions and other fund assets.

2. Assets will be invested to produce an expected return on investments which is based on levels of liquidity and investment risk that are prudent and reasonable under the circumstances that exist from time to time. Such circumstances will change over time as new investment vehicles become available.

3. The reduction of the System's funding costs, within prudent levels of risk, is a consideration in the organization and structure of the investment portfolio.

4. Investment performance will be compared to other large private and public pension funds with special emphasis on comparisons with large public funds.

5. Active and passive management fees, trading costs, and transaction related expenses, will be aggressively monitored and controlled. Reducing the cost of managing the System's assets will increase portfolio return over time.

6. The Investment Branch will conduct an annual planning session including an estimate of cash flows and an updated financial projection highlighting any modifications to the performance objectives.

7. The System's investment program must operate in compliance with all applicable State and Federal laws and regulations concerning the investment of pension assets.

8. The asset structure must provide for diversification of risk between asset classes to manage the risk/return relationship through strategic asset allocation.

INVESTMENT PERFORMANCE OBJECTIVES

The general investment objectives designed a framework for the operation of the investment function. The performance objectives can be divided into two components: (1) performance objectives for the overall investment portfolio and (2) performance objectives for the individual investment managers. The Board incorporates both levels of analysis in its monitoring of the investment portfolio performance.

There are four performance objectives for the overall investment portolio:

1. Relative to Strategic Asset Allocation Targets

2. Relative to Inflation

3. Relative to Actuarial Rate of Interest

4. Relative to System's Liabilities

The first objective identifies a comparative benchmark which reflects the System's unique asset allocation policy. This performance objective is a composite of the target weighting for each asset category multiplied by the expected return for that category. This performance number is compared to the actual asset allocation and actual return. Analysis identifies the contribution or detriment to performance caused by manager performance, market timing, and tactical asset allocation decisions.

The inflation objective compares the investment performance against the rate of inflation as measured by the Consumer Price Index (CPI) plus 3.5 percent. The CPI plus 2.0 percent is used in the calculation of the estimated salary increases for the members (teachers). The inflation measure provides a link to the System’s liabilities.

The actuarial rate of interest is reviewed and monitored by the Board as a measure of the long term rate of growth of the System’s assets. The actuarial rate of interest varies with market conditions with the current assumption of 8.0%. The actuary anticipates the investment portfolio will achieve higher returns in some years and lower returns in other years.

The last performance objective recognizes that liabilities are claims to the System's assets and must be paid in full and in a timely manner. The liabilities are a total of the future value of the System's participants benefit payments. The actuarial rate is used to discount the future value of the System’s liabilities to calculate the funded ratio.

PERFORMANCE BENCHMARK

To facilitate the periodic reporting to the Investment Committee and to provide a relative measure to gauge the success of both investment managers, and in categories, individualized performance benchmark are approve by the Board. The approved performance benchmarks are shown below:

Total Public Equity	- Weighted Russell 3000 Index and MSCI EAFE Index
Domestic Equity	- S&P 500 Index (large cap stocks) - Russell 2500 Special Index (small cap stocks)
International Equity	- MSCI EAFE Index
Total Public Debt	- Weighted LPF Index and World Government Bond Index
Domestic Debt	- Salomon Large Pension Fund Index
International Debt	- Salomon World Government Bond Index
Private Equity	- Weighted NCREIF Property Index and CPI + 12%
Real Estate	- NCREIF Property Index
Alternative Inv.	- Consumer Price Index (CPI) + 12%

Each investment manager, for domestic and international, equity and fixed income, has an individualized benchmark designed to measure their performance relative to the objective identified in their investment guidelines.

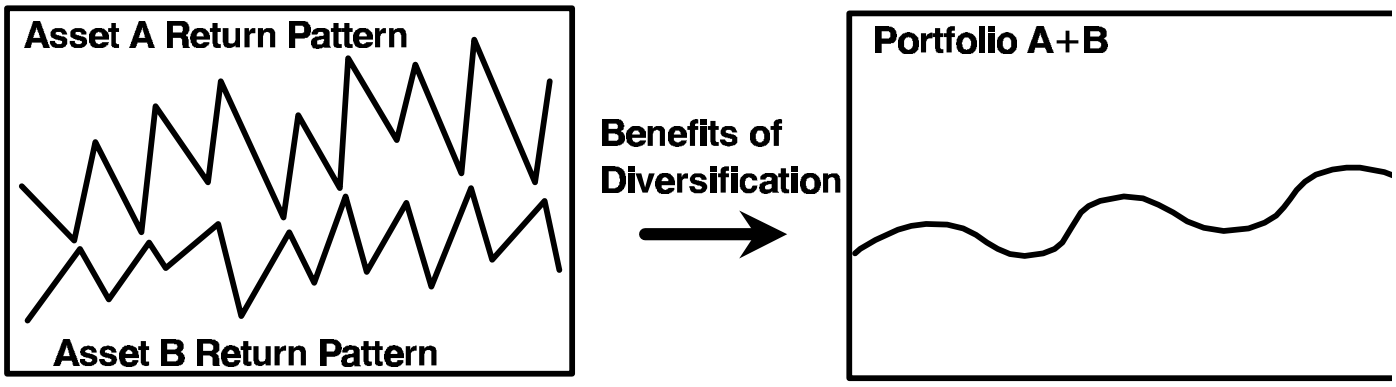
ASSET ALLOCATION

The goal of an investment portfolio in a defined benefit plan is to provide assets that meet the agreed upon long-term cash flows that the plan's participants will receive in retirement. In order to meet this goal, plan assets (the portfolio) must grow at least as quickly as the value of these cash flow requirements (the liabilities) to ensure that the overall plan remains in healthy financial condition. There are only two methods for increasing plan assets to meet plan liabilities: investment growth and contributions.

Higher investment growth will lead to lower required contributions and vice versa. However, the investment growth rate will be influenced heavily by the plan's tolerance for investment risk, which is reflected in the plan portfolio's asset allocation policy. Therefore, quantifying an acceptable level of overall portfolio risk associated with adopting a specific policy is critical. In addition, near-term cash flow requirements of the plan can influence portfolio structure. Building a portfolio across a spectrum of various classes of investment assets is the key step in addressing these and other issues.

A diversified investment portfolio consists of multiple assets whose investment returns respond differently to varying economic scenarios. Diversified portfolios are attractive because the combination of various assets (or asset classes) can reduce expected risk while maintaining expected return (see charts below).

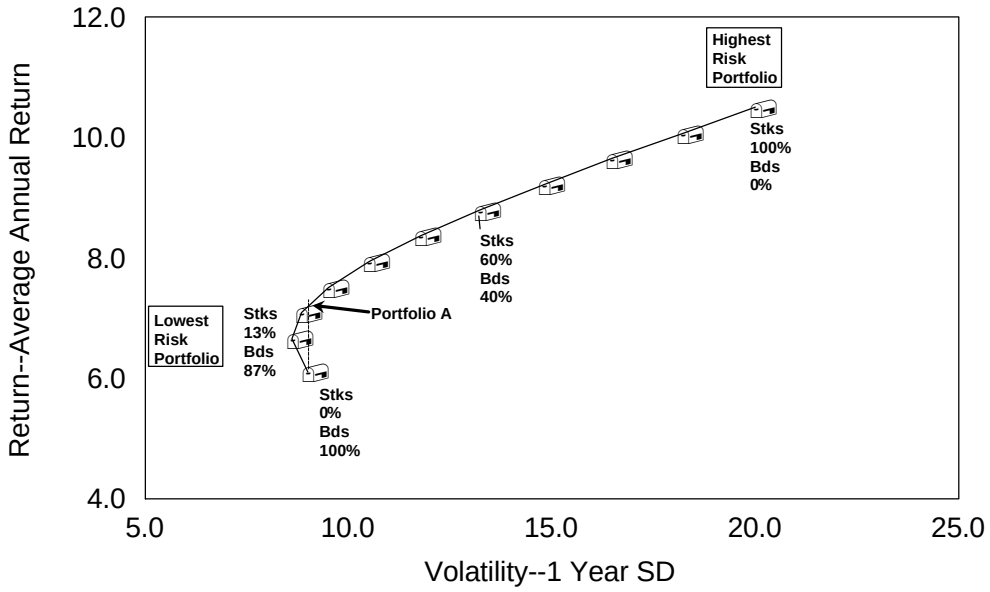
Diversification Enhances the Return/Risk Tradeoff



As the charts highlight, combining assets with different return patterns can produce a portfolio that has much lower volatility (risk) than any individual asset while producing returns that are competitive with either asset type. Increasing return while reducing risk increases the probability of meeting a specified return objective.

Efficient Frontier Analysis is a widely accepted method of analyzing the tradeoff between risk and return across portfolios having different mixes of assets. Through this quantitative technique (which relies on several critical assumptions), an optimization process identifies portfolios of assets providing the highest expected return, given a specified level of risk. The procedure continues to determine ideal portfolios at varying levels of risk until an entire range of ideal portfolios (termed an "efficient frontier") is identified below.

An Efficient Frontier for a Stock and Bond Portfolio



Assumptions

Asset Class	Expected Annual Return	Expected Annual Volatility
Domestic Equity:	10.50%	20.0%
Fixed Income:	6.25%	9.0%
Equity-Fixed Correlation:	0.15	

In selecting certain combinations of assets (such as domestic equity and fixed income) any rational investor will always consider the tradeoff between changes in return and changes in risk. At a minimum, investors should expect to receive a higher rate of return for an incremental increase in investment risk. In addition, investors should recognize that the return-for-risk tradeoff is not linear; that is, as one incurs more risk it becomes more difficult to realize a commensurate increase in return.

Each mix of assets is, in itself, a unique asset having its own return-vs.-risk tradeoff. As highlighted above, these asset portfolios can exhibit return patterns that differ greatly from any underlying asset. Depending on the extent of how individual assets move in relationship to each other (measured by correlation), certain mixes of assets could enhance the return-risk tradeoffs over investing in any isolated asset.

The curve-point in the curve in the efficient frontier chart shows when adding a certain proportion of stocks ceases to add value (simultaneously adding return and reducing risk). This point comes when domestic equities become 13% of the portfolio. Beyond this point, the only way to increase return is to increase risk incrementally. For those points along the line past the curve point, the only decision one has to make is how much incremental risk one is willing to accept. The only way to increase return will be to accept incremental increases in investment risk (uncertainty).

The line between the curve-point and the "100% stocks" point is termed the "efficient frontier." Any point along the efficient frontier represents that unique portfolio that offers the highest return for the given amount of risk.

Adding additional asset classes to the list of possibilities can enhance the return-risk tradeoffs among the ideal portfolios along the efficient frontier. For example, adding international equities to the stock-bond portfolios above improves the expected outcomes of the efficient frontier significantly

Asset Allocation Process

The key goal of the asset allocation process is develop an asset allocation policy that maximizes the likelihood that an investment portfolio's assets will, over the planning horizon, fund Plan benefits. To accomplish this task, an asset allocation study should contain several key steps.

Steps Involved in Setting Asset Allocation Policy

Overview and Planning Steps

1. Review rationale for policy.
   - importance of diversification
2. Review financial condition of Plan.
   - assets versus projected liabilities (balance sheet)
   - projected contributions versus projected benefits

Investment Related Steps

3. Review rationale for investment asset classes in light of plan financial requirements.
4. Develop expectations for asset class investment performance (returns, risks, correlations).
5. Identify investor-specific constraints that might limit investment strategies (e.g., liquidity).
6. Create model portfolios, incorporating objectives, assumptions, and constraints.
7. Isolate investor-specific model portfolio to represent an investor's asset allocation policy.
8. Perform additional sensitivity analyses to quantify impact of specific issues.
   - adjustments to required rate of return
   - shift in financial condition of Plan due to funding

Once the rationale for undertaking an asset allocation study is understood, a review of the financial condition of the plan becomes imperative. A key component of reviewing a plan's financial condition is studying the actuarial requirements of the plan. These requirements represent the plan's long-term liabilities and, when combined with the plan's investment portfolio, constitute a pension plan's balance sheet. Understanding what factors (such as changes in interest rates, benefit structures, and plan demographics) influence these liabilities is important. Changes in these and other underlying factors may alter a plan's liability structure. Such shifts could, in turn, impact the plan's financial condition.

Selecting Asset Classes for Portfolio Investment

As discussed earlier, there are three components required to model investment returns: (i) asset class expected returns, (ii) asset class risks, and (iii) correlations among asset classes. Investment consultants develop these components to be used to develop efficient frontiers quantitatively. STRS' current long-term expected returns and risks for various assets classes range from 4.0% to 15.0% per year.

Total Return and Risk Estimates
Assumed inflation level: 3.0% per year

Asset Class	Expected Annual Return	Expected Risk Annualized SD
Cash	4.00	1.5
Domestic Bonds	6.25	9.0
Global Bonds	6.10	9.0
Domestic Stocks	10.50	20.0
International Stocks	10.25	20.0
Private Markets	12.37	18.0
Emerging Markets	15.50	30.0

These return and volatility estimates reflect several basic relationships:

1. Investors or lenders of capital require an incremental real return premium as a reward for making capital available. Historically, this real risk-free rate has approximated 1% per year.
2. Equity-oriented investment should, over long periods, produce return premiums that are higher than their fixed-income counterparts.
3. The private markets asset class is a combination of both real estate and alternative investments.
4. The return assumptions for the publicly-traded asset classes do not account for added value opportunities within each asset class.
5. Higher expected total returns are the result of incurring incremental risk.

Asset Correlations

In addition to expected returns and risks, setting asset allocation policy also requires assumptions about how each asset's investment performance relates to the performance of the other assets. Quantification of these expectations comes in the form of a correlation matrix. Please note that correlations can vary over time.

Expected 10-Year Correlations

	Cash	Dom Bds	Glbl Bds	Dom Eq	Intl Eq	Priv Mkts
DomBds	.15					
GlblBds	.25	.65				
DomEq	.40	.50	.15			
IntlEq	.00	.00	.65	.25		
PrivMkts	.25	.25	-.30	.50	.15	

EmerMkts	.05	.35	.25	.25	.65	-.05

A Review of STRS Asset Allocation Policy

Given the above framework, a review of STRS' asset allocation policy can now take place. This review is a reasonable starting point in the Board's deliberations of STRS' 1998/99 Asset Allocation Policy. Over the last thirteen years, STRS' asset allocation policy has shifted modestly.

STRS Asset Allocation Policy Trends (in %)

Asset Class	**Current**	**1995**	**1993**	**1986**
Domestic Equities	38	34	33	40
Foreign Equities	25	18	18	15
Public Equity	63	52	51	55
Realty	5	5	10	10
Venture	5	3	7	5
Total Equity	73	60	68	70
Global	0	5	1	---
Fixed-Income	26	34	30	30
Cash	1	1	1	0
Stable Assets	27	35	31	30
Total	100	100	100	100

With the exception of 1995, STRS' investment policy has remained virtually intact from an equity/stable asset allocation viewpoint. In 1986, STRS' policy had an allocation of 70% equities and 30% stable assets. In 1997, STRS Board adopted a similar policy (73% equity and 27% stable assets). In 1995, STRS' policy emphasized equity-oriented assets to a lesser extent. This shift was largely the result of STRS' decision at the time to rely less on the private-equity portion of the portfolio.

STRATEGIC ASSET ALLOCATION

The System's asset allocation strategy utilized a design for today's needs, while anticipating the future capacity and growth of the investment portfolio. A strategic asset allocation target for public equity, private equity, liquidity, and public debt was established after reviewing a comprehensive asset allocation analysis completed by Pension Consulting Alliance. In conjunction with the strategic target, a range for each asset category has been established to provide flexibility designed to reduce rebalancing costs and allow flexibility to adapt to changing market conditions. To control the risk and return relationship each asset category must be

rebalanced to the strategic target occasionally. Rebalancing latitude is important and can significantly affect the performance of the portfolio. Blind adherence to a narrow increases transactions costs without a documented increase in performance. A rebalancing range that is too wide may cause undesired changes in the asset allocation. The identified range can be modified by the Investment Committee as determined appropriate. The range is plus or minus three percent around the strategic target for the major asset categories (domestic equity, international equity, and fixed income). The range is plus or minus two percent around the strategic target for the other asset categories (private equity and cash). The two or three percent range refers to the market value of the total investment portfolio.

Strategic Asset Allocation	Strategic Target	Range
Domestic Equity	38%	35% to 41%
International Equity	25%	22% to 28%
Total Public Equity	63%	57% to 69%
Private Equity *	10%	8% to 12%
Total Equity	73%	68% to 77%
Debt	26%	23% to 29%
Cash	1%	0% to 3%
Total Public Debt	27%	23% to 32%
Total Strategic Asset Allocation	100%	

* Please note that the allocated not funded portion of the private equity will be invested in the S&P 500 Indexed portfolio. This amount will be shown as private equity- S&P 500 Index.

INVESTMENT STRUCTURE

Investment structure guides and directs present and future investment decisions in a prudent manner. In the preparation of the investment structure a variety of issues were addressed including:

1. Active vs passive management styles including the relative percentage of each style.

2. The number and types of internal and external managers.

3. Appropriate reporting standards and time horizons.

ASSET ALLOCATION STRUCTURE

1. Based on academic studies, it has been determined that 91% of the total return is attributable

to the asset allocation decision. Consequently, each asset category shall remain within the range approved in the asset allocation adopted by the Board.

2. Control of the cash flows is critical to the success of long term investment strategies. Estimated cash flows shall be provided to the Investment Committee annually.

3. Each quarter, a report for the Chief Investment Officer will be completed identifying the salient aspects of the investments including a section on compliance with approved policies.

EQUITY STRUCTURE

1. The domestic equity portfolio will be managed using both passive (80% target) and active (20% target) strategies. The passive component will have both internal and external managers as approved by the Board. The active component will be managed externally. The number of active domestic equity managers is limited to sixteen.

2. The non-U.S. equity markets are more inefficient allowing active management to add value. The target will be an equal amount of active management (50%) and passive management (50%) strategies. Emerging markets will be utilized to enhance return and diversification. All non-U.S. equity will be managed externally with the number of active non-U.S. equity managers limited to sixteen.

FIXED INCOME STRUCTURE

1. The fixed income portfolio shall be comprised of investment grade securities using an enhanced indexing strategy. The internally managed portfolio will emphasize tracking the risk characteristics of the performance benchmark.

2. Cash reserves, including the cash portion of equity portfolios, shall be managed internally with emphasis on safety and liquidity. The portfolio shall be comprised of investment grade securities, A1/P1 rated short term debt, and other appropriate securities as approved in the policies and procedures.

ALTERNATIVE INVESTMENT STRUCTURE

1. The alternative investment portfolio will be comprised of limited partnerships and co-investments focusing on commitments to domestic venture and buyout partnerships and international buyout partnerships. The alternative investment advisor and staff will analyze each partnership and conduct appropriate due diligence with the objective of achieving upper quartile performance, as identified by Venture Economics.

2. Private equity investments have substantial fees and costs, consequently, emphasis will be placed on negotiating, monitoring, and controlling the direct and indirect costs of each limited partnership investment.

REAL ESTATE STRUCTURE

1. The real estate portfolio will be comprised of direct real estate investments and commingled funds (opportunistic funds) with adopted targets of 75% low to moderate risk and 25% moderate to high risk investments.

2. To more closely align the interests of the plan sponsor and real estate manager, emphasis will be placed on negotiating, monitoring, and controlling the cash flow (both income and expense) associated with each property.